

TECHNICAL MEMORANDUM

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FROM: Amy Essig Desai, Principal

DATE: September 10, 2014

RE: **ADDENDUM TO THE OPERATIONS, MONITORING, AND MAINTENANCE
PLAN, BASIS OF DESIGN REPORT
JORGENSEN FORGE EARLY ACTION AREA REMOVAL ACTION
U.S. EPA DOCKET NO. CERCLA-10-2013-0032
SEATTLE, WASHINGTON
FARALLON PN: 831-032**

Farallon Consulting, L.L.C. (Farallon) has prepared this Technical Memorandum on behalf of Earle M. Jorgensen Company (EMJ) to provide an Addendum to the *Operations, Monitoring, and Maintenance Plan (OMMP)* of the *Basis of Design Report (BODR) – Jorgensen Forge Early Action Area* prepared by Anchor QEA and approved by the U.S. Environmental Protection Agency (EPA) on August 16, 2013. The OMMP describes the long-term monitoring and maintenance requirements for the EMJ Removal Action to confirm that performance standards are being met in the years following construction, and to demonstrate that upland source controls at the Jorgensen Forge Facility at 8531 East Marginal Way South, Seattle, Washington (herein referred to as the Site) are effectively minimizing the potential for sediment recontamination. This Addendum to the OMMP of the BODR includes the addition of groundwater and stormwater sampling activities at the Site that will be performed following completion of the Removal Action.

This work is being performed in accordance with the requirements of the Administrative Settlement Agreement and Order of Consent (AOC) for Removal Action Implementation at the Site issued by EPA Region 10 on November 5, 2012 under EPA Docket No. CERCLA-10-2013-0032. As discussed in Section 6.2 of the OMMP, expected surface sediment constituents of concern (COC) concentrations within the Removal Action Boundary will increase over time.



The stormwater and groundwater sampling is being performed to confirm that upland source controls at the Site are effective and that groundwater along the shoreline does not contain concentrations of the metals arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc; and polychlorinated biphenyls (PCBs) that could result in recontamination of the shoreline bank and in-water sediments.

The purpose of this Addendum to the OMMP is to outline the sampling activities that will be performed at the Site in 2014, 2015, and 2016 following completion of the Removal Action. This Addendum to the OMMP includes a description of the scope of work to be implemented, sampling procedures, and reporting.

GROUNDWATER MONITORING AND SAMPLING

Following the Removal Action, groundwater samples for compliance monitoring will be collected annually for 3 years during the fourth quarter of 2014, 2015, and 2016. Groundwater elevations will be measured and groundwater samples collected from shoreline monitoring wells MW-6, MW-39, MW-42, MW-47, MW-52, and PL2-JF04A at the Site (Figure 1). Groundwater samples will be collected during a rising tide.

GROUNDWATER SAMPLING PROCEDURES

Groundwater samples will be collected in accordance with EPA (1996) guidance document *Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures*. The monitoring wells will be purged at a low-flow rate (i.e., 100 to 300 milliliters per minute) using a peristaltic or bladder pump and dedicated polyethylene tubing. The pump intake will be placed at the approximate center of the screened interval. Temperature, pH, conductivity, and dissolved oxygen will be monitored during purging using a YSI 600XL water-quality meter or equivalent meter equipped with a flow-through cell to determine when stabilization of these parameters occurs.

Groundwater samples will be collected directly from the pump outlet following stabilization of temperature, pH, conductivity, and dissolved oxygen. If the monitoring well is completely dewatered during purging, samples will be collected when groundwater in the well has recovered at least 80 percent of the pre-purge casing volume. If low-flow sampling methods are not practical, the monitoring well will be allowed to recharge for no longer than 2 hours following cessation of purging, and will be sampled using a dedicated disposable polyethylene double-check valve bailer and sampling cord. The sample containers will be filled directly if collected from a pump or the water samples will be transferred immediately from the bailer into laboratory-supplied sample containers, with care taken to minimize turbulence. Care will be taken not to handle the seal or lid of the container when the sample is decanted into the container. The containers will be filled completely to eliminate headspace, and the seal/lid will be secured.

Each sample container will be labeled with the date and time sampled, well identification and number, project number, and preservative(s), if any. Sample collection information will be



documented on a Chain of Custody form. The samples will be placed into a cooler at approximately 4 degrees Celsius and transported to the laboratory under standard chain-of-custody protocols.

A Low Flow Well Purging and Sampling Data form (Attachment A) will be completed by a Field Scientist for each well sampled. Farallon will record the depth to groundwater, well purging information, and other pertinent hydrologic measurements and supplementary information collected during groundwater sampling at each monitoring well.

Purge water will be stored temporarily in a labeled container on the Site pending receipt of waste profiling results. An estimated volume of 20 to 30 gallons of purge and decontamination water is anticipated to be generated during each sampling event. Non-reusable sampling and health and safety supplies and equipment will be disposed of in a waste dumpster at the Site.

The well cap and monument will be secured following sampling. Damage to or defect in a well cap or monument will be noted, and the well cap or monument will be scheduled for replacement if necessary.

GROUNDWATER SAMPLE DESIGNATION AND LABELING

The groundwater samples collected for compliance monitoring will be assigned a unique sample identifier and number. The number will include a prefix of the well identification and the date. For example, a groundwater sample collected from monitoring well MW-6 on August 15, 2015 would be numbered MW6-081515. The sample identification will be placed on the sample label, the Well Purging and Sampling Data form, and a Chain of Custody form.

CONSTITUENTS OF CONCERN

Groundwater samples will be submitted to an EPA-accredited laboratory for laboratory analysis for metals, including total and dissolved arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc by EPA Methods 6010B/6020/7471A; and PCBs by EPA Method 8082.

STORMWATER MONITORING AND SAMPLING

Stormwater monitoring and sampling activities will include two stormwater monitoring and sampling events conducted during the second and fourth quarters of 2014, 2015, and 2016. The stormwater samples will be collected from the official effluent sample location for Industrial Stormwater General Permit No. WAR-003231. This effluent sample location is connected to the conveyance line for Outfall 003, the only active outfall on the Site (Figure 1).

Stormwater samples will be collected during an appropriate storm event twice a year (i.e., during each of the following two quarters):

- Second Quarter: April, May, or June; and
- Fourth Quarter: October, November, or December.



STORMWATER SAMPLING PROCEDURES

Stormwater sampling will be performed in accordance with the Washington State Department of Ecology (Ecology) sampling guidance *How To Do Stormwater Sampling - A Guide For Industrial Facilities* published in January 2003, revised in March 2010. Stormwater samples will be collected within the first 12 hours of stormwater discharge, or as soon as practicable.

A Stormwater Sample Collection form (Attachment B) will be completed by a Field Scientist for each sampling and attempted sampling event. The following information will be recorded for each sampling event:

- Sample date;
- Sample time;
- A notation of whether the sample was collected within the first 12 hours of stormwater discharge;
- An explanation of why a sample could not be collected within the first 12 hours of a stormwater discharge event, if it was not possible;
- Sample location;
- Record of field sampling results for pH and turbidity;
- Method of sampling and method of sample preservation, if applicable; and
- Individual who performed the sampling.

STORMWATER SAMPLE DESIGNATION AND LABELING

The stormwater samples collected for confirmation monitoring will be assigned a unique sample identifier and number. The number will include Outfall 003 and the date. For example, a stormwater sample collected from Outfall 003 on August 15, 2015 would be numbered Outfall003-081515. The sample identification will be placed on the sample label, the Stormwater Sample Collection form, and the Chain of Custody form.

CONSTITUENTS OF CONCERN

Stormwater samples will be submitted to an EPA-accredited laboratory for laboratory analysis for metals, including total and dissolved arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc by EPA Methods 6010B/6020/7471A; and PCBs by EPA Method 8082.

REPORTING

Groundwater and stormwater monitoring reports will be incorporated into the OMMP monitoring report following Year 1 and 3 monitoring events. A stand-alone report, Year 2 OMMP monitoring report, will be prepared following the Year 2 monitoring event that summarizes the groundwater and stormwater monitoring results only. Each monitoring report



will be prepared and submitted to EPA within 90 days of receipt of final validated analytical results for that event. The reports will include a description and evaluation of all monitoring activities conducted during the monitoring year. Follow-up meetings with EMJ and EPA will be scheduled as necessary to review and discuss the monitoring results, particularly to agree on a path forward if contingency response actions are recommended. At a minimum, the monitoring reports will include the information in OMMP Section 7 and summarized below.

GENERAL REPORTING

Each monitoring report will generally contain the following information:

- Summary of all field activities, including a description of deviations from the OMMP and the Addendum to the OMMP and the reasons for the deviations;
- Final Quality Assurance/Quality Control (QA/QC) report to ensure that data quality is sufficient to meet project objectives and support project decisions; and
- Electronic (PDF) copies of relevant field and analytical data forms and reports, including QA/QC data.

GROUNDWATER MONITORING

The following groundwater monitoring and sampling information will be included in the OMMP monitoring reports:

- Figures drawn to scale that depict the surveyed monitoring well locations, groundwater analytical results, and surrounding property use;
- A narrative description of the sampling methods and procedures;
- Summary tables of groundwater analytical results presented in comparison to applicable Sediment Quality Standards Protective of Groundwater screening levels (Attachment C); and
- Conclusions regarding the groundwater quality in the shoreline monitoring wells.

STORMWATER MONITORING

The following stormwater monitoring and sampling information will be included in the OMMP monitoring reports:

- Figures drawn to scale that depict the stormwater discharge sampling location and location of stormwater drainage system, stormwater analytical results, and surrounding property use;
- A narrative description of the sampling methods and procedures;
- Summary tables of stormwater analytical results presented in comparison to applicable Ecology MTCA Method B Standard Formula Values for Surface Water and Ecology Toxic Substances Criteria for Marine Water screening levels (Attachment C); and



- Conclusions regarding the analytical results of COCs in stormwater and source control effectiveness at the Site.

Attachments: Figure 1, *Proposed Groundwater and Stormwater Compliance Sampling Locations*

Attachment A, Low Flow Well Purging and Sampling Data Form

Attachment B, Stormwater Sample Collection Form

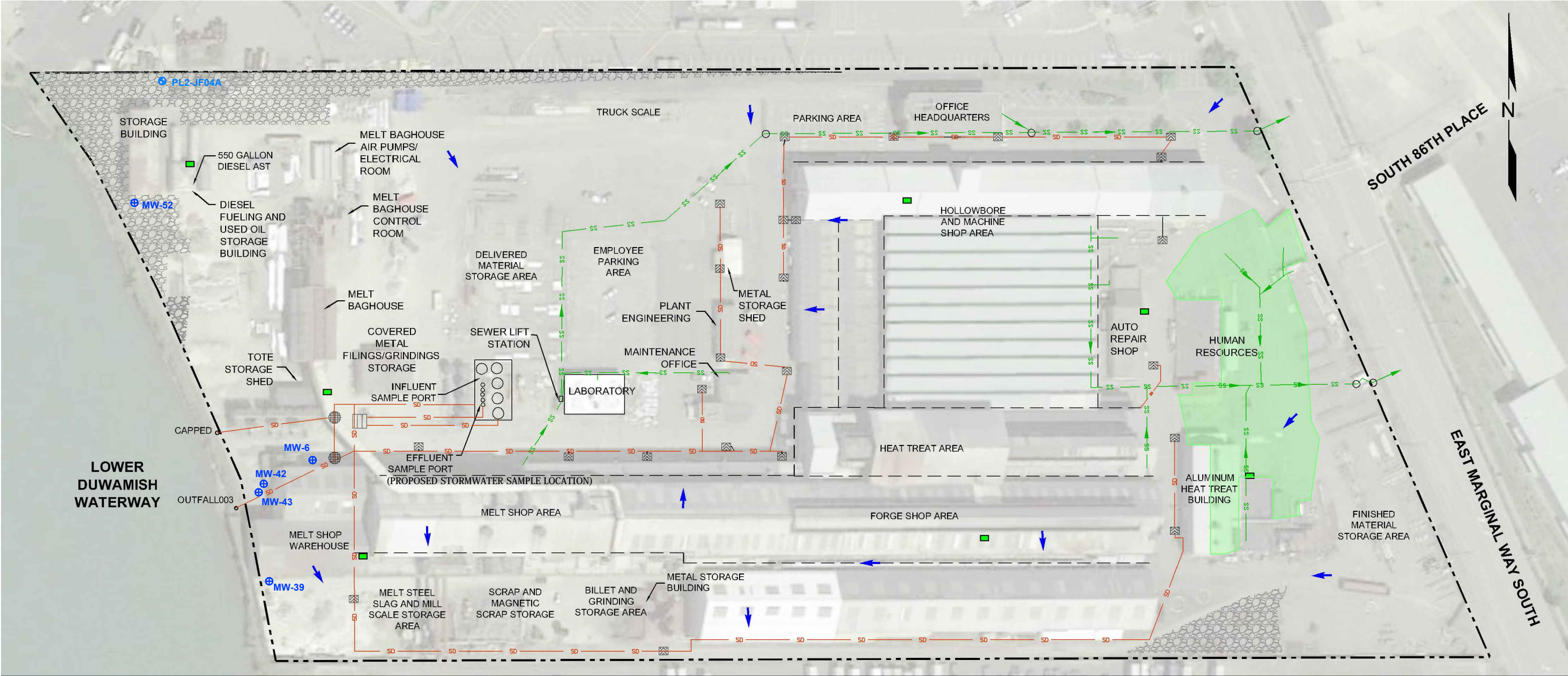
Attachment C, Screening Level Values and Laboratory Limits of Quantitation

AED:bw

FIGURE

**ADDENDUM TO THE OPERATIONS, MONITORING, AND MAINTENANCE
PLAN, BASIS OF DESIGN REPORT
Jorgensen Forge Early Action Area Removal Action
Seattle, Washington**

Farallon PN: 831-032



LEGEND

- | | | | | | |
|-----|--|--|------------------------------|--|-----------------------------|
| --- | PROPERTY BOUNDARY | | GRAVEL SURFACE (PERVIOUS) | | SPILL KIT LOCATION |
| SD | STORMWATER PIPE | | SANITARY SEWER DRAINAGE AREA | | STORMWATER COLLECTION VAULT |
| --- | ROOF CONVEYANCE | | STORMWATER FLOW ARROW | | CATCH BASIN |
| SS | SANITARY SEWER PIPE AND FLOW DIRECTION | | MONITORING WELL | | MANHOLE |
| | | | BOEING MONITORING WELL | | |

0 110
Scale in feet

NOTE:
STRUCTURES AND FEATURES SHOWN ON THIS FIGURE WERE NOT
VERIFIED BY SURVEY BY SOUNDEARTH STRATEGIES INC. LOCATIONAL
INFORMATION HAS BEEN ADAPTED FROM APPENDIX C OF THE
ENGINEERING REPORT DRAFTED BY ANCHOR QEA, LLC.
FIGURE PROVIDED BY SOUND EARTH
STRATEGIES DATED APRIL 08, 2014



Drawn By: DEW

Checked By: AED

Date: 9/9/14

Disk Reference: 831032

FIGURE 1
PROPOSED GROUNDWATER AND
STORMWATER COMPLIANCE SAMPLING LOCATIONS
BASIS OF DESIGN REPORT OPERATIONS,
MONITORING, AND MAINTENANCE PLAN ADDENDUM
JORGENSEN FORGE FACILITY
FARALLON PN: 831-032

ATTACHMENT A
LOW FLOW WELL PURGING AND SAMPLING DATA FORM

ADDENDUM TO THE OPERATIONS, MONITORING, AND MAINTENANCE
PLAN, BASIS OF DESIGN REPORT
Jorgensen Forge Early Action Area Removal Action
Seattle, Washington

Farallon PN: 831-032

[illegible]

G:\Forms and Templates\Field Forms\GW Purge Form\LOW FLOW WELL PURGING

ATTACHMENT B
STORMWATER SAMPLE COLLECTION FORM

ADDENDUM TO THE OPERATIONS, MONITORING, AND MAINTENANCE
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Jorgensen Forge Early Action Area Removal Action
Seattle, Washington

Farallon PN: 831-032

STORMWATER SAMPLE COLLECTION FORM

Jorgensen Forge Facility, Seattle, Washington

Monitoring Event: _____

Sample Date/Time: _____

Sampler Name: _____

Signature _____

Sample Location	Monitoring Point-Outfall 003
Stormwater sample collected? If no explain why in comments below.	
Sample time (one time grab).	
Sample collected within first 12 hours of discharge event? If no, explain in comments below.	
Sample appearance (i.e.; clear, slightly cloudy, cloudy, floating materials)	
Stormwater pH using meter or narrow-range indicator paper.	
Visible sheen present?	
Turbidity Reading (NTU):	
Comments:	

ATTACHMENT C
SCREENING LEVEL VALUES AND LABORATORY LIMITS OF
QUANTITATION

ADDENDUM TO THE OPERATIONS, MONITORING, AND MAINTENANCE
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Attachment C

Screening Level Values and Laboratory Limits of Quantitation

Parameter	Analytical Method	Units	Screening Levels					Laboratory LOQ
			SQS Protective Groundwater Screening Level ¹		Ecology MTCA Method B Standard Formula Values for Surface Water ²		Ecology TSC for Marine Water ³	
Metals			Total	Dissolved	Total	Dissolved		Total and Dissolved
Arsenic	EPA 6010B/6020	µg/L	NE	227	NE	--	36	0.1
Cadmium	EPA 6010B/6020	µg/L	NE	2.6	NE	--	1.03	0.1
Chromium	EPA 6010B/6020	µg/L	NE	306	NE	--	10	0.1
Copper	EPA 6010B/6020	µg/L	NE	123	NE	--	3.1	0.1
Lead	EPA 6010B/6020	µg/L	NE	11	NE	--	2.5	0.1
Mercury	EPA 7471A	µg/L	NE	0.0052	NE	--	--	0.1
Silver	EPA 6010B/6020	µg/L	NE	1.5	NE	25,900	--	0.1
Zinc	EPA 6010B/6020	µg/L	NE	33	NE	--	81	0.1
Polychlorinated Biphenyls (PCBs)								
Aroclor 1016	EPA 8082	µg/L	0.44		0.00582		--	--
Aroclor 1221	EPA 8082	--	--		--		--	--
Aroclor 1232	EPA 8082	--	--		--		--	--
Aroclor 1242	EPA 8082	--	--		--		--	--
Aroclor 1248	EPA 8082	µg/L	0.27		--		--	--
Aroclor 1254	EPA 8082	µg/L	0.16		0.00166		--	--
Aroclor 1260	EPA 8082	µg/L	0.058		--		--	--
Aroclor 1262	EPA 8082	--	--		--		--	--
Aroclor 1268	EPA 8082	--	--		--		--	--
Total PCBs	EPA 8082	µg/L	0.27		--		--	0.1 ⁴

NOTES:

	Indicates selected screening level value for groundwater
	Indicates selected screening level value for surface water.

¹Science Applications International Corporation (SAIC). 2007. Draft Source Control Action Plan - Slip Duwamish Waterway. Prepared for the Washington State Department of Ecology. February 2007.

²Ecology Cleanup Levels and Risk Calculations (CLARC) under the Model Toxics Control Act (MTCA) Cleanup Regulation, Standard Method B Formula Values for Surface Water, November 2001.

³Ecology Water Quality Standards for Surface Waters of the State of Washington, Toxic Substances Criteria for Marine Water, Chronic Toxicity, Chapter 173-201A of the Washington Administrative Code, November 2006.

⁴Ecology TSC values are less than the laboratory practical detection limit, therefore, the practical detection limit is used as the screening level.

Ecology = Washington State Department of Ecology
EPA = U.S. Environmental Protection Agency
LOQ = Limits of Quantitation
NE = not established
SQS = Sediment Quality Standards
TSC = Toxic Substances Criteria